

$$33. \quad y = 3x - x^3 + 5$$

2nd der test $f'(a) = 0$

if $f''(a) > 0$  min

if $f''(a) < 0$  max

$$y' = 3 - 3x^2 = 0 \quad x = \pm 1$$

$$y'' = -6x \quad y''(1) = -6 \quad y''(-1) = 6$$

max at $x = 1$ min at $x = -1$

Oct 22-9:30 AM

4.4 optimization

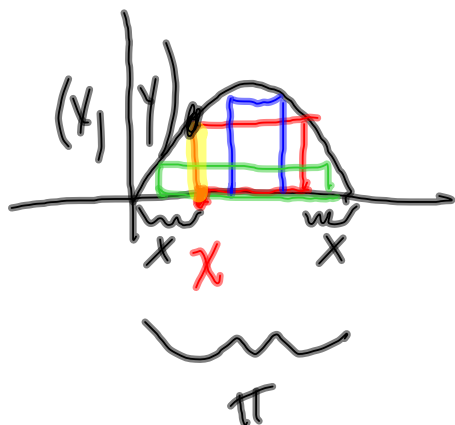
strategy p 219

1. understand the problem
2. draw pic, label variables
3. write equation domain (what numbers make sense)
4. c.p. / e.p.
5. use 1st der test (sign graph) or 2nd der test to identify location of max & min
6. plug in to original answer the question

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Ex 2 p 219

$$y = \sin x$$



$$A = b \cdot h$$

what ~~$x = .25$~~

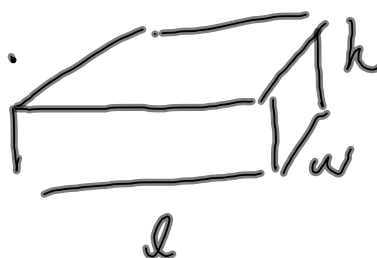
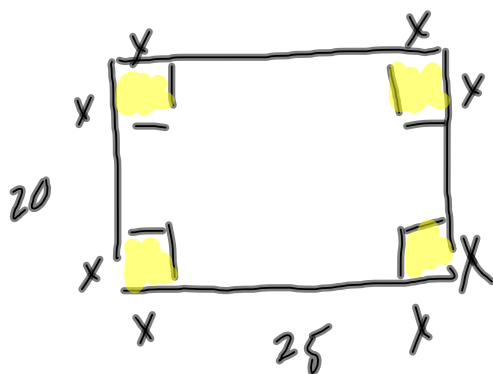
$$b = \pi - 2x$$

$$h = \sin x$$

$$A = (\pi - 2x) \sin x$$

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Ex 3

max volume $v = l \cdot w \cdot h$

$$v = (25 - 2x)(20 - 2x)x$$

~~domain~~ $0 \leq x \leq 10$

$$h = x$$

$$l = 25 - 2x$$

$$w = 20 - 2x$$

Oct 22-10:16 AM